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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,462	05/15/2006	Anatoly Arov	02-2433	1733
7590 11/05/2007 Elias Borges Sutie 406 555 Burnhamthorpe Road Toronto, ON M9C 2Y3 CANADA			EXAMINER TRIEU, THAI BA	
			ART UNIT 3748	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

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# Office Action Summary

Application No.

10/579,462

Applicant(s)

AROV, ANATOLY

Examiner

Thai-Ba Trieu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 May 2007 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 05/15/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Priority*

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### *Information Disclosure Statement*

The listing of references in the specification (See Page 1) is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

### *Drawings*

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the **"two outwardly extending nodes"** must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

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number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: **"8"** (See Figure 24); and **"360"** (See Figure 30). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and

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informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

The disclosure is objected to because of the following informalities:

- In the Title, the recitation of ***"MULTPLE"*** should be replaced by – **MUTIPLE** –  
(for correcting typo error).

Appropriate correction is required.

### ***Claim Objections***

Claims 1-5 and 7-9 are objected to because of the following informalities:

- In claim 1, the recitation of ***"each impeller"*** in line 5 and the recitation of ***"the impeller"*** in line 5 should be replaced by – **each of said impellers** – (for consistency of claims).
- In claim 1, the recitation of ***"said valve element"*** in lines 10-11; and claim 4, the recitation of ***"each valve element"*** in line 2, should be replaced by – **each of said rotary valve elements**– (for consistency of claims).
- Claims 2-5 and 7-9, ***"An"*** before ***"engine or pump"*** should be replaced by –**The** --.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

***Claims 1, 3/1, 4/1 and 5/1 are rejected under 35 U.S.C. 102(b) as being anticipated by Groeneveld et al. (Pub. Number WO 86/06786 A1).***

Groeneveld discloses an engine or pump comprising at least one toroidal cylinder (3), two impellers (4, 5) with radial vanes rotatably mounted in said cylinder (3) with said impellers (4, 5) cooperating with said cylinder to define working chambers between adjacent vanes (8-11 and 12-15), each impeller including to one side thereof at least one rotary valve element (27, 28) which rotates with the impeller (4, 5) and selectively opens and closes passages (25, 29; 30, 26) in said cylinder housing to said working chambers for inletting (25) and exhausting (26) a working media; said rotary valve elements (27, 28) cooperating with said housing such that the position of said valve element defines media flow through said engine or pump (See Figures 1-6, 8-10, Abstract);

wherein each impeller (4, 5) has two diagonally opposed radial vanes (8-11 and 9-15) which rotate within a toroidal cylinder of said housing with said four working chambers being defined between said vanes (See Figure 2); and

wherein each valve element (27, 28) includes two outwardly extending nodes (25, 29; 30, 26) that cooperate with a valve portion of said housing, said

nodes closing ports in said housing to said working chambers as a function of the angular position of said valve elements (See Figure 4); and

wherein each valve element has a series of arcuate passages (19, 20) which connect said working chambers with ports in said housing to selectively open and close ports in said housing to said working chambers, each arcuate media passage (19, 20) including a port adjacent a vane of said engine or pump (See Figure 10).

***Claims 6-7 are rejected under 35 U.S.C. 102(b) as being unpatentable over Way (Patent Number 3,112,062).***

Way discloses an engine or pump assembly comprising at least two toroidal cylinders interconnected by a common drive train (63, 77); each toroidal cylinder having a pair of rotating impellers (68, 69); each impeller (68, 69) having two diagonally opposed vanes (72) cooperating with vanes of the other impeller to define four working chambers which change in volume as the vanes (72) rotate in said toroidal cylinder; said impellers (68, 69) of each combustion unit being driven by a corresponding part of gear train (63, 67) for controlling the vane movement as a function of the position in said toroidal cylinder with said gear trains (64, 73; 65, 74) of several toroidal cylinders being interconnected to form common drive train; said drive train (64, 73; 65, 74) controlling the relative position of the impellers (68, 69) of those cylinders and thereby determine the relative position of said vanes and wherein said units cooperate by being out of phase with each other in a manner to reduce output variation by complementing each

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other; using one toroidal cylinder as a compressor unit driven by said common drive train and providing compressed media to said working chambers of other toroidal cylinders used as combustion units (See Figure 6-8 and 10, Column 4, lines 19-50 and lines 71-74).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

***Claims 2, 3/2, 4/(2-3), and 5/(2-3) are rejected under 35 U.S.C. 103(a) as being unpatentable over Groeneveld et al. (Pub. Number WO 86/06786 A1), in view of Groeger (Patent Number 3,430,573).***

Groeneveld discloses the invention as recited above; and further discloses wherein each impeller (4, 5) has two diagonally opposed radial vanes (8-11 and 9-15) which rotate within a toroidal cylinder of said housing with said four working chambers being defined between said vanes (See Figure 2); wherein each valve element (27, 28) includes two outwardly extending nodes (25, 29; 30, 26) that cooperate with a valve portion of said housing, said nodes closing ports in said housing to said working chambers as a function of the angular position of said valve elements (See Figure 4), and wherein each valve element has a series of arcuate passages (19, 20) which connect said working chambers with ports in said housing to selectively open and close



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ports in said housing to said working chambers, each arcuate media passage (19, 20) including a port adjacent a vane of said engine or pump (See Figure 10).

However, Groeneveld fails to disclose a drive train having at least two elliptical gears.

Groeger teaches that it is conventional in the rotary piston apparatus art, to utilize a drive train having at least two elliptical gears (6, 7, 6a, 7a, 14, 15) controlling said impellers and wherein each elliptical gear rotates (6, 7, 6a, 7a, 14, 15) around a focal point and where gear parameters are defined as function of minimum vane opening allowing formation of four chambers in each toroidal cylinder (See Figure 2-7, Column 4, lines 32-71) .

It would has been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized a drive train having at least two elliptical gears, as taught by Groeger, to improve the efficiency of the Groeneveld device, since the use thereof would have controlled the fluid being delivered into or out of the engine/pump.

***Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Way (Patent Number 3,112,062), in view of Groeger (Patent Number 3,430,573).***

Way discloses the invention as recited in the rejection of claim 6; however Way fails to disclose the structural details of said drive gear train and its function.

Groeger teaches that it is conventional in the rotary piston apparatus art, to utilize said drive train including at least 6 elliptical gears (6, 7; 6a, 7a, 14, 15) synchronizing vane positions in two toroidal cylinders (2, 3a), said at least 6 elliptical gears including 3

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gears (7a, 15, 7; 6a, 14, 6) in mesh for one pair of vanes of one unit and one pair of vanes of the other unit, and a further 3 gears (7a, 15, 7; 6a, 14, 6) in mesh for a second pair of vanes in the one unit and a second pair of vanes of the other unit (See Figures 3-7, Column 4, lines 32-61); and wherein each elliptical gear (6, 7; 6a, 7a, 14, 15) rotates around focal point and where gear parameters are defined as function of minimum vane opening allowing a formulation of four chambers in each toroidal cylinder positioned planetary to input/output shaft (4a, 10, a) of said drive train (6, 7; 6a, 7a, 14, 15) (See Figure 3-7, Column 4, lines 32-61).

It would have been obvious to one having ordinary skill in the art at that time the invention was made, to have utilized the structural details of said drive gear train and its function, as taught by Groeger, to improve the efficiency of the Way device, since the use thereof would have satisfactorily operated the engine/pump within a wide range of rotational speeds of the rotary member for transmitting or receiving torques from the pistons/vanes.

### ***Conclusion***

The IDS (PTO-1449) filed on May 15, 2006 has been considered. An initialized copy is attached hereto.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bright (US Patent Number 3,476,056) discloses a pump with oscillating vanes.

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- Praxmarer et al. (US Patent Number 3,205,875) disclose a four-cycle rotary internal combustion engines.

- Namikawa (US Patent Number 3,169,487) discloses a high pressure pump.

- Janosi (Pub. Number WO 95/17582 A1) disclose a rotary motion drive.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

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USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



TTB  
October 29, 2007

Thai-Ba Trieu  
Primary Examiner  
Art Unit 3748